

User's Manual

PRELIMINARY



TPT101/TPR101

Twisted Pair Transmitter and Receiver for VGA and Stereo Audio Signals

Precautions

Safety Instructions • English



This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.



This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français



Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).



Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conservier les instructions • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch



Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.



Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español



Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.



Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

Alimentations • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegen gestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Lithium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearla ni eliminarla.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

Product Overview

DESCRIPTION

The **TPT101** Twisted Pair A/V Transmitter and **TPR101** Twisted Pair A/V Receiver combine to make a system for sending high-resolution VGA video signals and stereo audio signals up to 500 feet using Category 5 unshielded twisted pair (UTP) cable. The **TPT101** offers an unobtrusive, low-profile design that allows installers to mount the unit in a wall, on a podium or in custom boardroom / presentation furniture using a standard 1-gang junction box. In addition, the **TPT101 / TPR101** twisted pair video / audio transmission system lets A/V system designers and installers take advantage of the compact size, flexibility, and extremely low cost of CAT5 UTP cable.

PRODUCT FEATURES

- **Accepts High-Resolution Video Signals** - at virtually any resolution or refresh rate. The **TPT101** is compatible with analog video signals including VGA, SVGA XGA, SXGA, UXGA, MAC, SUN, SGI and other high-resolution workstations. The **TPT101** can also be used to carry three separate composite video signals, one composite video and one Y/C video signal, or one component video signal.
- **One or Two Cable Operation** - The **TPT101** transmitter and **TPR101** receiver are linked with one or two CAT5 cables depending on desired signal and power configuration:
 - Single Cable:** Video and remote power, *or*
Video and mono audio (local power supply required)
 - Double Cable:** Video, remote power and stereo audio
- **Remote Power** - **TPT101** Transmitter receives power directly from the **TPR101** Receiver when the units are linked with CAT5 cable(s) (no local power supply required).
- **Audio Buffering Circuitry** - accepts unbalanced stereo audio signals and converts them to balanced audio.
- **Auto Power** - **TPT101** automatically powers up when an input cable is connected, and powers down when the cable is removed.
- **Advanced Cable Equalization** - with separate low frequency and high frequency equalization controls provides excellent image with a variety of cable lengths.
- **RGB Skew Controls** - Compensate for timing delays found in longer CAT5 cables. These controls (an Inline exclusive) provide excellent performance with virtually any new or installed CAT5 cable (specialized media-rated CAT5 cables are not required!)
- **Attractive Design Features** - The **TPT101** features a beveled faceplate with low-profile connectors.
- **Available in Two Finishes** - **TPT101-1** - Black. **TPT101-2** - White (PMS Cool Grey 3).

Using special technology that allows high-resolution video and stereo audio transmission over CAT5 cables, the **TPT101 / TPR101** system leverages the many advantages of CAT5 cable and provides A/V systems designers with an economical, space efficient solution for high-resolution video and audio signal transmission in a variety of applications.

Compatibility

INPUT

High Resolution Computer Video Signals

The **TPT101 / TPR101** system is compatible with high-resolution video signals from almost any computer that outputs an analog video signal. The unit will work with signals at virtually any resolution and refresh rate. Compatible computer video signals include VGA, SVGA, XGA, SXGA, UXGA, MAC, SUN, SGI and other high-resolution computers outputting an analog video signal. Compatible input signal formats are RGBHV, RGBS and RGsB.

Low Resolution Video Signals

The **TPT101 / TPR101** system can also be used to carry low resolution (NTSC / PAL) video signals. The unit will accommodate the following signal combinations:

- (3) Separate Composite Video Signals *or*
- (1) Composite Video Signal and One Y/C Video Signal *or*
- (1) Component Video Signal (R-Y / B-Y / Y *or*

Audio Signals

The **TPT101** provides a 3.5mm stereo mini connector that will accept an unbalanced stereo audio input signal. Depending on the **TPT101 / TPR101** system configuration, the audio signal may be sent as stereo audio or converted to mono audio.

OUTPUT

Computer Video Output

Featuring a 15-pin HD female output port, the **TPR101** video output signal is compatible with high-resolution data grade monitors and data / graphics projectors. The **TPR101** outputs the video signal in the same format as it was received at the **TPT101** input, providing optimal compatibility with a wide range of data displays.

Audio Outputs

The **TPR101** provides (2) 5-pin captive screw terminals. Terminal A is for stereo or mono audio output. The output can be wired for a balanced audio output signal only. Terminal B is reserved (only used with **TPT111** transmitter).

CAT5 CABLE LINKS

Dual RJ45 female output ports are provided on the back of the **TPT101** for connection to one or two CAT5 cables.

Dual RJ45 female input ports are provided on the back of the **TPR101** for connection to one or two CAT5 cables, depending on the desired signal and power configuration:

*Note: The **TPT101 / TPR101 System** has been optimized for Category 5 unshielded twisted pair (UTP) cable. However, the system will work with other twisted pair cables that conform to the appropriate pin outs and performance characteristics (see page 8). The system may be used with CAT3 cable, but video performance will be compromised and maximum cable lengths and input signal resolution must be decreased. As new, higher performance types of twisted pair cables are developed in the future that exceed the capabilities of CAT5 (CAT6, CAT6e, CAT7, etc.), the **TPT101 / TPR101 System** offers the flexibility to operate with these new types of UTP cables.*

ADVANTAGES OF CAT5 CABLE

Category 5 cable is a 4-pair, twisted pair cable that's extremely affordable, costing only a fraction of high-resolution multi-conductor coaxial cables. In addition, CAT5 cable features:

- **Quick and Easy Termination** - Utilizing RJ45 connectors, CAT5 cables offer fast, easy and extremely economical cable terminations.
- **Easy Handling and Compact Size** - CAT5 cable is much thinner than high-resolution and super high-resolution coaxial cables, providing easy cable pulls and preserving conduit space. Using multiple **TPT101** transmitters and **TPR101** receivers allows users to send a dozen or more RGBHV signals in the same conduit space required for a single super high-resolution 5-conductor coaxial cable.
- **INLINE CAT5 Cables** - INLINE offers the **IN9500** series of CAT5 cables, available in lengths from 50 feet to 300 feet (longer lengths are available via special order). These high quality CAT5 cables are pre-terminated with molded RJ45 connectors for enhanced durability.

SELECTING THE RIGHT CAT5 CABLE

The CAT5 standard was created to address issues related to high bandwidth transmission of data signals. CAT5 cables were not originally intended for video and audio signal transmission and unfortunately, many performance characteristics that are important for good quality transmission of video signals are not included in the CAT5 spec and are not tested by most cable manufacturers. Many cable performance parameters such as attenuation, bandwidth, capacitance and near-end cross talk are important to video performance; however, impedance and pair-to-pair skew have the greatest effect when transmitting high-resolution video signals over CAT5 cables.

Impedance - There is a wide variance in impedance between different brands of cables. The TIA / EIA* standard for CAT5 impedance is 100 ohms +/- 15 ohms. Some CAT5 cables have an impedance of 100 ohms +/- 50 ohms, rendering them virtually useless above 10 MHz. The visible result may be multiple images or "ghosting" in the displayed image.

Skew - Another factor that affects the performance of CAT5 cable is skew (timing differences on multi-pair cable). Signals arriving at different times could result in misconvergence (improperly aligned colors) on the video display device. To ensure good performance sending high-resolution video signals over UTP cable using a typical CAT5 transmitter / receiver product, we generally recommend that you select a CAT5 with less than 50 nanoseconds of skew per 100 meters of cable. Because skew is cumulative, it becomes more visible with longer cable lengths. Fortunately, the **TPR101** receiver includes individual RGB skew timing controls to bring the signals into time alignment, completely removing the visible effects of RGB skew timing delays. **For this reason, CAT5 cable skew performance is not as critical with the TPT101 / TPR101 twisted pair transmission system as it is with other CAT5 transmission systems.**

Specialized CAT5 Cables

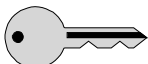
A few manufacturers have now responded with CAT5 cable formulations that are specially designed to match the stringent requirements of high-resolution video signal transmission. A major advantage of the **TPT101 / TPR101** system are its sophisticated cable equalization and exclusive RGB skew timing controls, which provide superb performance with virtually any CAT5 cable (specialized media-grade CAT5 cables are not required!)

*Telecommunications Industry Association / Electronic Industries Association

Installation

This section offers step-by-step instructions for installing the **TPT101** Twisted Pair Transmitter and the **TPR101** Twisted Pair Receiver. Application Diagrams are provided on pages 9 - 11.

KEY CONCEPT

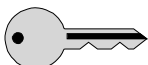


*Installation of the **TPT101** / **TPR101** System must only be carried out by qualified technicians.*

*Note: Read the instructions carefully before initiating the installation procedure. Make sure that there is no power connected to any of the units and that the **TPR101** power switch is off.*

- 1.) **Install the Junction Box** - in accordance to the standards set forth in the National Electrical Code. The **TPT101** can also be installed in an existing 1-gang junction box (see Dimensions Diagram on page 18). You may also install the **TPT101** in any desired wall location using an optional **IN9181** wall-mounting bracket.

KEY CONCEPT



***Important Safety Issue:** When dealing with long cable runs, it is possible that you will encounter different grounding potentials throughout the facility. It is very important to connect the grounding terminal on the back of the **TPT101** to local earth ground to prevent possible electrical shock.*

- 2.) **Place / Install the TPR101 at the Desired Location** - Make sure that the unit is seated on a flat surface or is securely installed in a standard 19" equipment rack using an optional **IN9080** rack shelf. When attaching any *INLINE* unit to an *INLINE* rack mount shelf, the four (4) rubber feet must be removed from the bottom of the unit. Secure the **TPR101** to the rack mount shelf using two (2) #6 - 32 x 1/4" long screws (provided with the rack shelf). Two **TPR101** Twisted Pair Receivers can be mounted side-by-side on a single rack shelf, or a single unit may be mounted along with an optional **IN9088B** blank plate. Together, the **TPR101** and the **IN9088B** fit snugly in a 1U rack space. The unit can also be mounted to virtually any flat surface using the optional **IN9252** table mounting brackets.
- 3.) **Set the TPT101 / TPR101 switches as appropriate for your installation and run one or two CAT5 cables between the TPT101 / TPR101.** The **TPT101** transmitter and **TPR101** receiver can be linked with either one or two CAT5 cables depending on the desired signal and power configuration:

Configuration A - Single CAT5 Link: RGBHV Video Only (no audio) with Remote Power for TPT101 - (See *Application Diagram A* on page 9 and *Control / Connector Diagrams* on Pages 13 & 14)

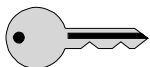
- **TPT101 Switch:** Set the Power switch on the rear of the **TPT101** to REMOTE.
- **TPR101 Switches:** Set the Link A Mode switch (located on the left rear of the **TPR101**) to the REMOTE POWER position.
- **CAT5 Cable Connection:** Connect one end of the CAT5 cable to the LINK A VIDEO Output Port on the rear of the **TPT101**, and the other end to the LINK A Input Port on the rear of the **TPR101**.
- **Do not connect a local power supply to the TPT101.**

Configuration B - Single CAT5 Link: RGBHV Video + Mono Audio with Local Power for TPT101 - (See *Application Diagram B* on page 10 and *Control / Connector Diagrams* on Pages 13 & 14)

- **TPT101 Switches:** Set the Power switch on the rear of the **TPT101** to LOCAL. Set the Audio switch on the rear of the TPT101 to MONO.
- **TPR101 Switches:** Set the Link A Mode switch (located on the left rear of the **TPR101**) to the MONO AUDIO position.
- **CAT5 Cable Connection:** Connect one end of the CAT5 cable to the LINK A VIDEO Output Port on the rear of the **TPT101**, and the other end to the LINK A Input Port on the rear of the **TPR101**.
- **Apply Power to the TPT101** - using the **IN9206** 15 VDC; 1A local power supply (included). The correct polarity is silk-screened next to the power connector (2-pin captive screw terminal) on the back of the unit. **Be extra careful to connect the power supply positive wire (with the red heat shrink) to the TPT101 power connector's (+) terminal, and the power supply negative wire to the TPT101 power connector's (-) terminal. Connecting the power with the reverse polarity may permanently damage the unit! If in doubt, measure the power cable with a voltmeter to verify the positive and negative terminals.**

*Note: The **TPT101** Transmitter automatically powers up when the input cable is attached and powers down when the cable is removed (the Auto Power LED on the front of the unit will illuminate).*

KEY CONCEPT



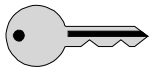
*When extending the DC power cable for distances of 50' or more, use an 18-gauge to 22-gauge power cable (thinner cables may cause problems). The **INLINE IN8500-2P** power cable is well suited for this application.*

Configuration C - Dual CAT5 Link: RGBHV Video + Stereo Audio with Remote Power for TPT101 - (See *Application Diagram C* on page 11 and *Control / Connector Diagrams* on Pages 13 & 14)

- **TPT101 Switch:** Set the Power switch on the rear of the **TPT101** to REMOTE. Set the Audio switch on the rear of the TPT101 to STEREO.
- **TPR101 Switches:** Set the Link A Mode switch (located on the left rear of the **TPR101**) to the REMOTE POWER position.
- **CAT5 Cable Connection:** Connect one end of the first CAT5 cable to the LINK A VIDEO Output Port on the rear of the **TPT101**, and the other end to the LINK A Input Port on the rear of the **TPR101**. Repeat the process again for the second CAT5 cable, connecting the LINK B connector on the **TPT101** to the LINK B connector on the **TPR101**.
- **Do not connect a local power supply to the TPT101.** When the **TPR101** power switch is in the ON position, the **TPT101** automatically powers up when the input cable is attached (the Auto Power LED on the front of the unit will illuminate).

Note: Always test your cable(s) prior to any permanent installation.

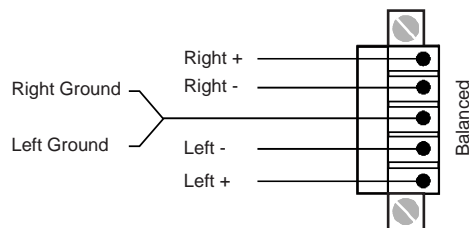
- 4.) **Carefully Attach the TPT101 Transmitter to the Outlet Box** - making sure that none of the cables are pinched or damaged. Make sure that the GND screw terminal on the back of the **TPT101** is properly grounded.

KEY CONCEPT

*It is imperative that the wired pairs in the **TPT101** / **TPR101** CAT5 system adhere to the wiring standards shown on page 8, otherwise the system will not function properly. The pertinent standard for **INLINE**'s CAT5 cable is the **TIA 568B**. In order for the **TPT101** / **TPR101** system to function properly, the CAT5 wire pairs (regardless of their color) must be maintained within both RJ45 connectors.*

- 5.) **Set the sync mode switch on the back of the TPR101** as appropriate for the type of video signal transmitted:
 - **RGBHV / RGBS Computer Video Signals:** Set the switch to SYNC SEP
 - **RGsB Computer Video Signals / Composite / Y/C / Component Video Signals:** Set the switch to SYNC PASS.
 - 6.) **Connect the Display Device** to the **TPR101** 15-pin VGA output port using an **IN8000** / **IN800M** Series VGA cable or an **IN9045** Series 15-Pin HD Male to 5-BNC cable.
 - 7.) **For Applications with Audio Transmission** - connect the audio cable to the appropriate pins on the **TPR101** 5-pin captive screw terminal labeled Audio Output A. Make sure that the stereo audio output is connected appropriately for a balanced audio signal as required by the installation (see diagram below).
- Note: Terminal A is for audio output. Terminal B is reserved for applications with the TPT111.*

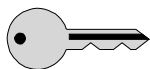
Balanced Output - connect to Left +, Left-, Right+, Right- and Ground connectors.



- 8.) **Apply Power to the TPR101** - using the **IN9230** power cord (included).
- 9.) **Connect the Computer Graphics Card** - to the **TPT101** 15-pin video input port.
 - **PC / MAC / SGI Computers with 15-pin HD Video Ports** - can be connected via **IN8000-1** / **IN8200-1** Series high-resolution coaxial VGA cables.
 - **Older Macintosh computers with 15-pin D connectors and Workstations with 3, 4 or 5 BNC connectors** can be connected using the appropriate input cables listed in the chart on the following page.
- 9.) **Connect the Computer Sound Card Output** - (if applicable) to the **TPT101** 3.5mm female stereo audio input connector using an **IN8200-1** Series cable [15-pin HD with 3.5mm stereo mini], or an **IN9106** audio patch cable (3.5mm stereo mini male to 3.5mm stereo mini male). For computers with RCA connectors, use the **IN9107** audio adapter cable [(1) 3.5mm stereo mini male to (2) RCA male].
- 10.) **Turn On** - the computer, **TPR101**, all powered speakers and all remote data monitors.

- 11.) **Optimize the image using the TPR101 Cable EQ controls and RGB skew controls.** The **TPR101** features high and low frequency controls (located on the front panel) that enhance image detail and sharpness by boosting high frequencies and selected mid-range frequencies. Three skew adjustments (located on the rear panel) allow users to compensate for misconvergence (improperly aligned colors), which often occurs when high-resolution video signals are carried over long UTP cable runs. See the External Controls Section on page 12 for more details on each control.

KEY CONCEPT



*For best results you should adjust the **TPR101** cable equalization controls and RGB skew controls in the following order. If necessary, you may repeat steps 2 - 4 again to fine-tune the image after the initial adjustment.*

1. Before making any other adjustments, set the RGB skew controls to minimum position (fully counter-clockwise position) using the **IN9339** adjustment tool provided.
2. Adjust the Low Frequency cable equalization control as needed to eliminate visible image smear.
3. Adjust the High Frequency cable equalization as needed to provide a sharp image with good detail.
4. If misconvergence occurs on the display (red, green or blue are not aligned properly), use the **IN9339** adjustment tool provided to adjust the RGB skew controls as needed to compensate for RGB delays occurring in the CAT5 cable. The controls are delicate, so you should only use a fine blade adjustment tool such as the **IN9339** and take care not to force the control at either end of the adjustment range.

ADAPTER / EXTENSION CABLES

The **TPT101** has a female 15-pin HD VGA-type video input port. The following input cables / adapters are available to support various computers and video signals:

| Computer | 3' | 6' | 12' | 25' | 35' + |
|---|------------------|------------------|-------------------|-------------------|-------------------|
| VGA: 15-Pin HD | | | | | |
| Input Cable (M-M) | IN8003M-1 | IN8006M-1 | IN8012M-1 | IN8025M-1 | IN80xxM-1 |
| VGA with Stereo Audio: 15-Pin HD with 3.5mm (M-M) mini DIN | | | | | |
| Input Cable (M-M) | IN8203M-1 | IN8206M-1 | IN8212M-1 | IN8225M-1 | IN82xxM-1 |
| MAC with 15-Pin D: | | | | | |
| Input Cable (M-M) | | IN9140M | | IN9144M | |
| MAC G3, G4 and PowerBook with 15-Pin HD* / SGI with 15-Pin HD: | | | | | |
| Input Cable (M-M) | | IN8006M-1 | IN8012M-1 | IN8025M-1 | IN80xxM-1 |
| SUN / SGI: 13W3 | | | | | |
| Call Inline | | | | | |
| Workstation: 3 / 4 / 5 BNC (RGsB / RGSB / RGBHV) | | | | | |
| Input Cable (M-M) | | IN9045-L6 | IN9045-L12 | IN9045-L25 | IN9045-Lxx |
| NTSC / PAL Video: Composite / Y/C / Component | | | | | |
| Input Cable (M-M) (Connect to Red, Green and Blue BNC Connectors Only) | | IN9045-L6 | IN9045-L12 | IN9045-L25 | IN9045-Lxx |

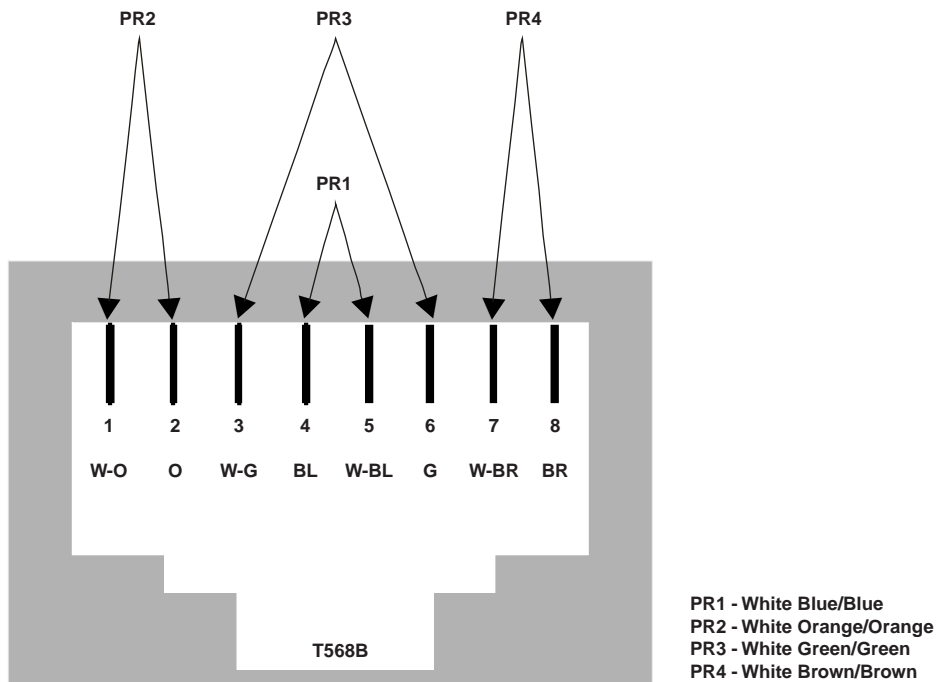
*Newer Mac G3 models (with translucent cases) have 15-Pin HD connectors (pins arranged in 3 rows). Older G3 models (with solid white enclosures) incorporate 15-Pin D connectors (pins arranged in 2 rows).

SUGGESTED MAXIMUM CABLE LENGTHS

Several factors will affect the video signal quality you can expect using the **TPT101 / TPR101** system including the input signal resolution and refresh rate, the quality of the CAT5 cable and the length of the cable run. Generally speaking, the higher the signal bandwidth, the shorter the distance it can be transmitted along any cable (coaxial or UTP) before it begins to degrade. The table below provides the maximum recommended cable lengths at various resolutions for the **TPT101 / TPR101** system using CAT5 cable:

| Resolution | Maximum Length |
|-------------|----------------|
| 1600 x 1200 | 250' |
| 1280 x 1024 | 300' |
| 1024 x 768 | 500' |
| 800 x 600 | 500' |
| 640 x 480 | 500' |

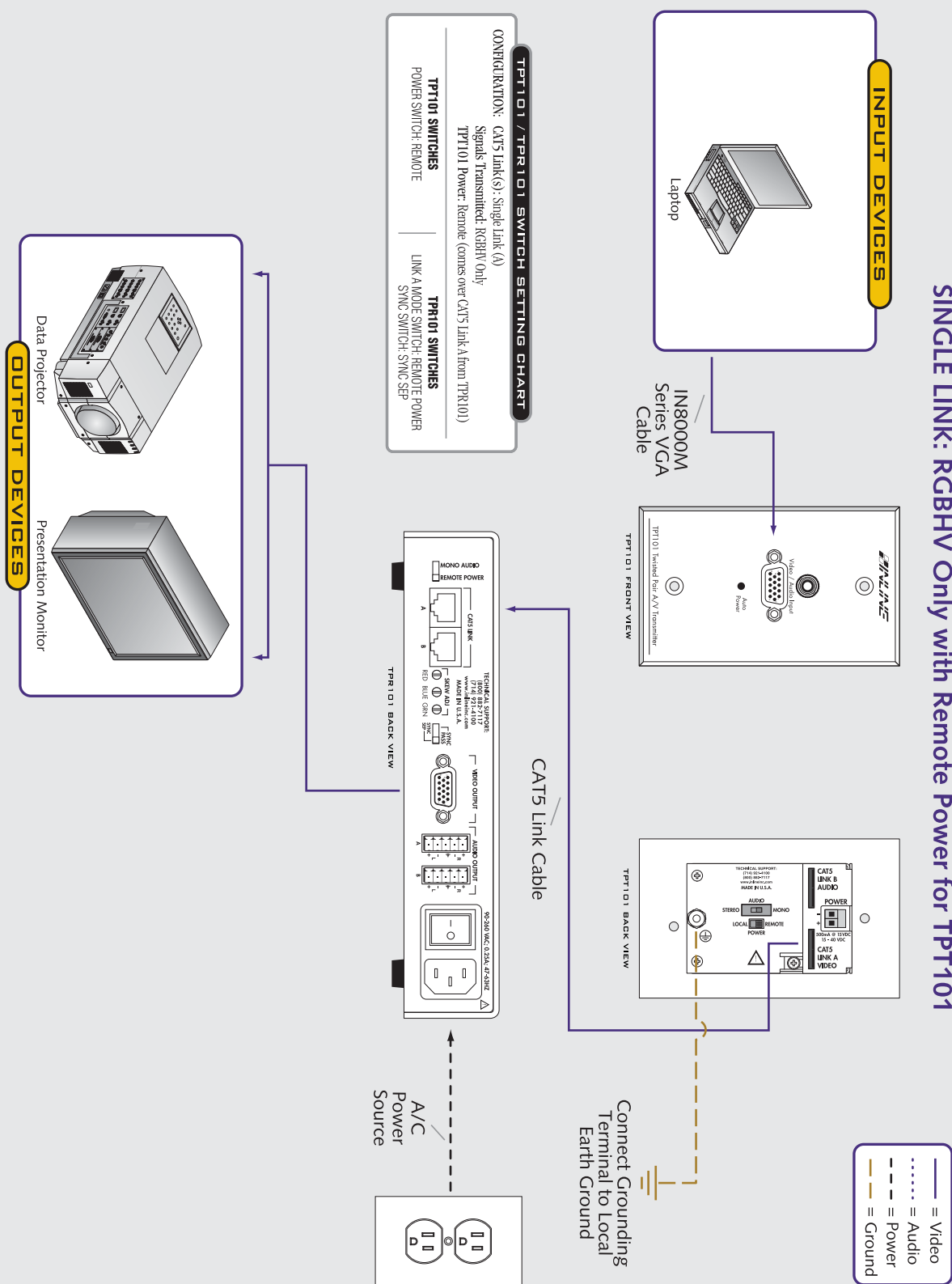
TIA 568B STANDARDS FOR CAT5 CABLE - EIGHT POSITION MODULAR JACK PAIR ASSIGNMENTS FOR RJ45 CONNECTORS



TPT101 TWISTED PAIR TRANSMITTER / TPR101 TWISTED PAIR RECEIVER

APPLICATION DIAGRAM A

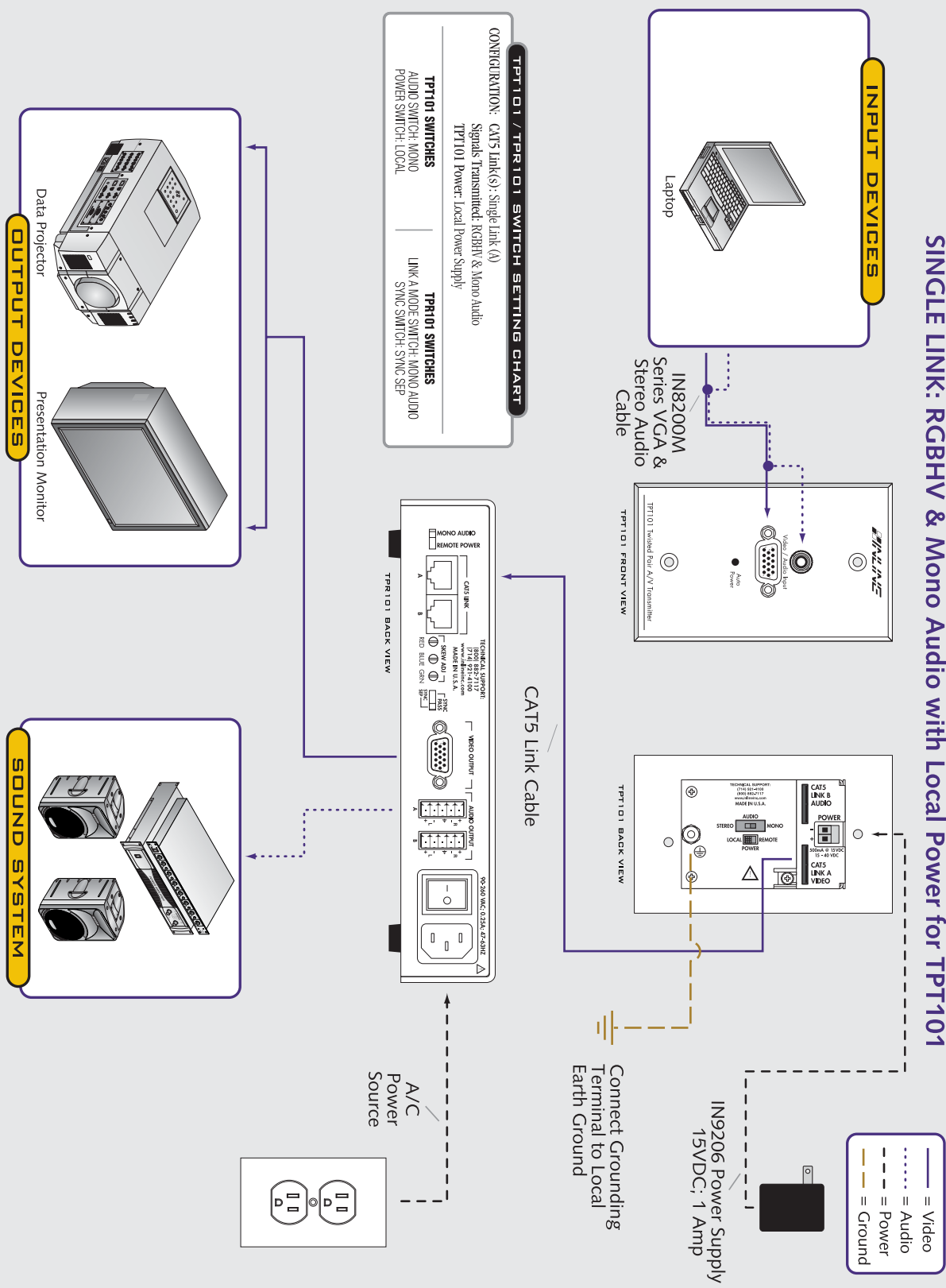
SINGLE LINK: RGBHV Only with Remote Power for TPT101



TPT101 TWISTED PAIR TRANSMITTER / TPR101 TWISTED PAIR RECEIVER

APPLICATION DIAGRAM B

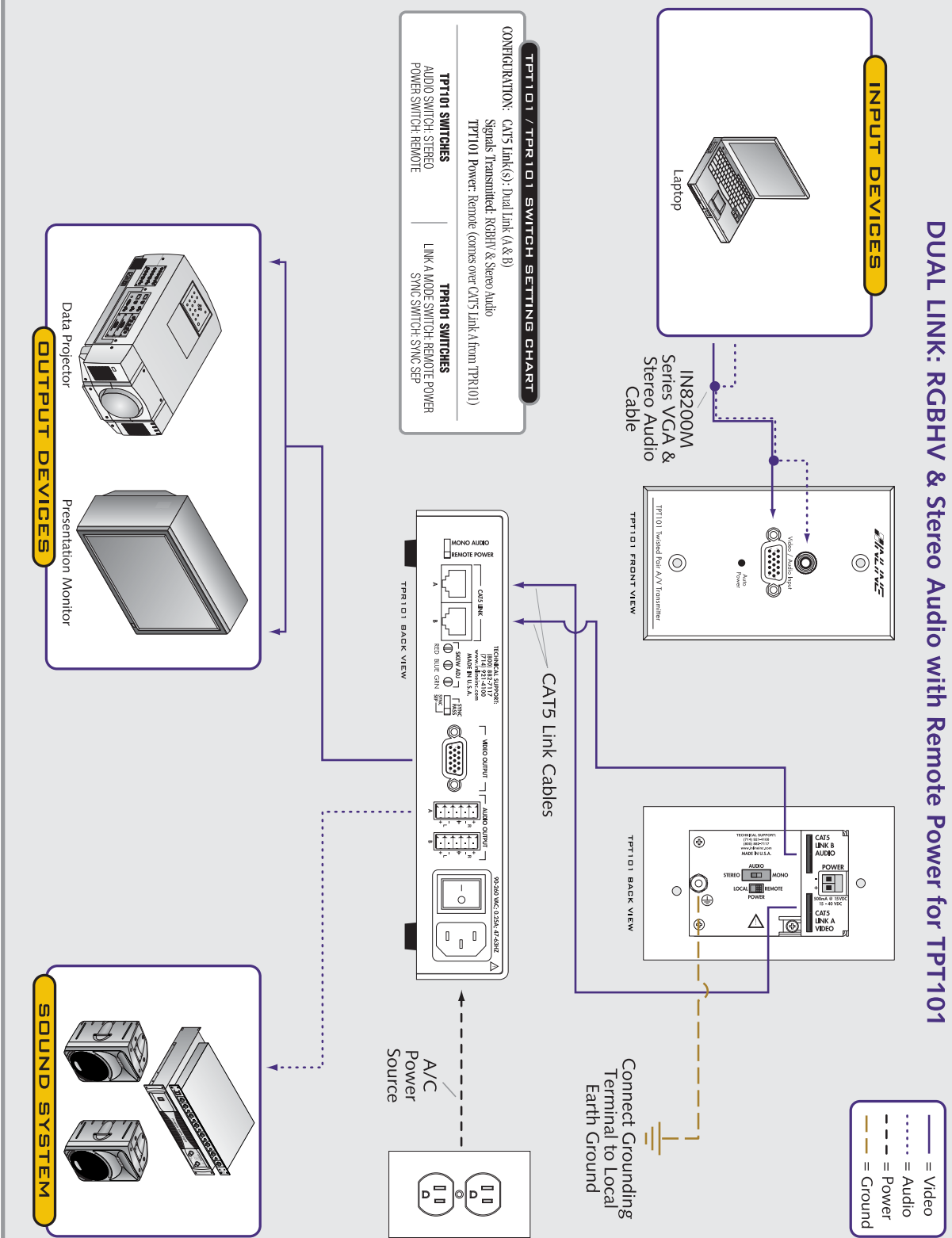
SINGLE LINK: RGBHV & Mono Audio with Local Power for TPT101



TPT101 TWISTED PAIR TRANSMITTER / TPR101 TWISTED PAIR RECEIVER

APPLICATION DIAGRAM C

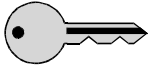
DUAL LINK: RGBHV & Stereo Audio with Remote Power for TPT101



External Controls

The **TPR101** features several controls for optimizing image quality. The location of the front and rear panel controls is illustrated in the **TPR101 Control and Connectors Diagram** on page 13.

KEY CONCEPT



*For best results you should adjust the **TPR101** cable equalization controls and RGB skew controls in the following order. If necessary, you may repeat steps 2 - 4 again to fine tune the image after the initial adjustment.*

1. Before making any other adjustments, set the RGB skew controls to minimum position (fully counter-clockwise position) using the **IN9339** adjustment tool provided.
2. Adjust the Low Frequency cable equalization control to eliminate visible image smear.
3. Adjust the High Frequency cable equalization to provide a sharp image with good detail.
4. If misconvergence occurs on the display (red, green or blue are not aligned properly), use the **IN9339** adjustment tool provided to adjust the RGB skew controls to compensate for RGB delays occurring in the CAT5 cable.

TPR101 FRONT PANEL CONTROLS

The **SELECT Button** on the front panel allows users to toggle between the high and low frequency controls (the front panel LED's will illuminate accordingly to indicate the current mode). After selecting **HIGH FREQ** or **LOW FREQ**, use the **CABLE EQ Adjustment Control** to increase or decrease the equalization. Press on the right side of the control to increase the cable EQ compensation; press on the left side of the control to decrease the cable EQ compensation.

Low Frequency Control - boosts the midrange frequencies that tend to diminish over long cable runs. This signal loss results in a smearing effect to the right hand side of letters or lines. The factory default setting is minimum cable EQ.

Hint: While making this adjustment, it may be helpful to create a screen with a white background and tall, black vertical lines. Adjust the low frequency control until the smear (darkness) to the right of letters or lines is minimized. Over-adjustment (too much equalization) will cause a negative smear (brightness).

High Frequency Control - is used to maximize the sharpness of small details. Like the low frequency control, the high frequency control also provides image enhancement for high-resolution video signals by increasing clarity and edge detail (again, to compensate for signal loss during long cable runs).

Hint: While making the adjustment, use words / letters as your point of reference.

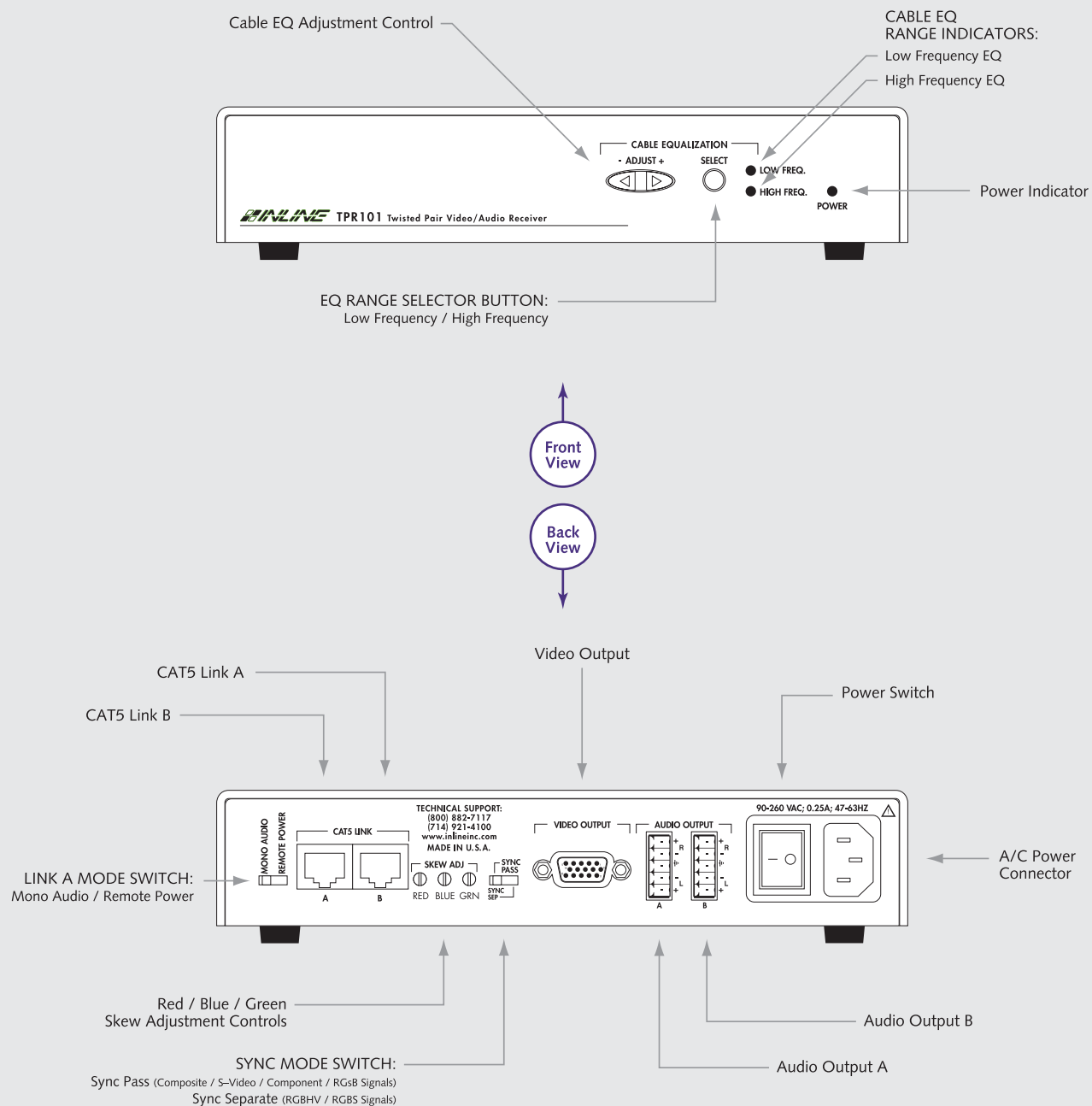
Increasing the high frequency level will minimize the negative images / highlights that appear *before* the letters. Negative images / highlights that appear *after* the letters indicate overpeaking. Pressing the **➤** button will increase the high frequency, and pressing the **◀** button will decrease it. The high frequency adjustment range is 0 in the minimum position, and 61 in the maximum position. The factory default setting is minimum.

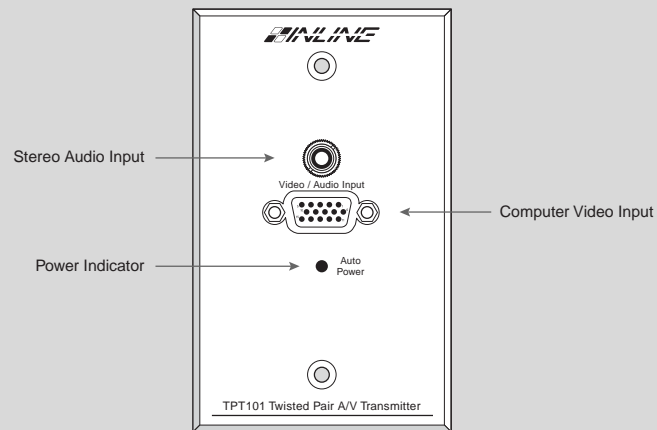
TPR101 REAR PANEL CONTROLS

Skew Adjustment - Three Skew Adjustment pots are located on the rear of the receiver. These adjustments allow users to individually increase or decrease each color's relative timing. Use the **IN9339** Adjustment Tool (included) to gently adjust the skew control pots. Since each control has an adjustment range of only $\frac{3}{4}$ of a turn, users must take care not to force the control beyond the end of the adjustment range. Turn the red, green and / or blue adjustment pots clockwise to increase the delay, and counterclockwise to decrease it. For example, if the leading edge of a large black-to-white transition on the display screen is red, adjust the red pot until the inappropriate color is gone. The factory default setting is minimum.

TPR101 TWISTED PAIR RECEIVER

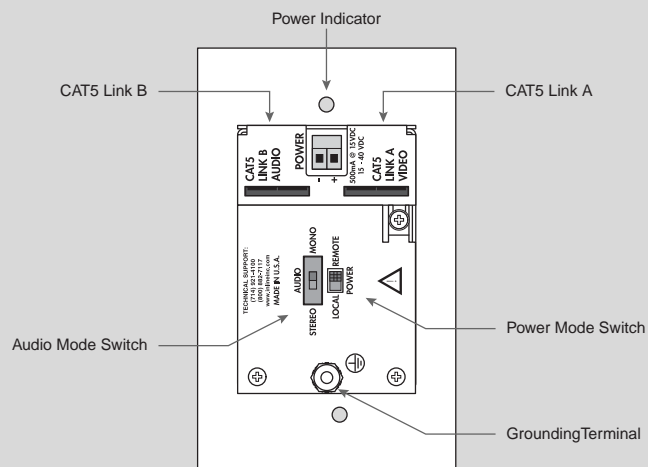
CONNECTORS & CONTROLS



TPT101 TWISTED PAIR TRANSMITTER**CONNECTORS & CONTROLS**

Front View

Back View



Specifications

| TPT101 Twisted Pair Transmitter | |
|---|--|
| Video Input Connector | (1) 15-pin HD female |
| Stereo Audio Input | (1) 3.5mm Stereo mini female |
| Output Connectors | (2) RJ45 female |
| Video Input Signals | Analog Video, 1.5 Vp-p max. Sync Signals: TTL |
| Compatible Signal Formats | RGBHV, RGBS, RGsB, Composite, S-Video, Component |
| Audio Input Signals | Line Level Stereo Audio |
| Power Supply | Local Power Mode: IN9206 15VDC, 1A External Adapter Remote Power Mode: Power Provided by TPR101 |
| Power Requirements | Accepts 15 - 40 VDC Requires 500mA @ 15VDC |
| Product Weight | .22 lb. / 0.1 Kg |
| Shipping Weight | 2.3 lbs. / 1.1 Kg |
| Dimensions (with front plate) | 4.5"H x 2.75"W x 1.7"D / 11.4cm x 7.0cm x 4.3cm |
| Regulatory Approvals | UL 1950, CAN / CSA-22.2 No. 950, 3 rd Edition CE: EN55022 (1987), EN50081-1 (1991), EN50082-1 (1992 and 1994), EN60950-92 |
| Parts Included | |
| TPT101-1 or TPT101-2: Twisted Pair Transmitter for High-Resolution Video and Stereo Audio IN9206: 15VDC; 1A Power Supply TPT101 / TPR101 Operation Manual | |

| TPR101 Twisted Pair Receiver | |
|--|--|
| Input Connector | (2) RJ45 female |
| Video Output Connector | (1) 15-pin HD female Output Signal Has Same Video Format as Input |
| Audio Outputs | (2) 5-pin captive screw terminals for Stereo or Mono Balanced Audio |
| Power Supply | 90 - 260VAC; 0.25A; 47 - 63Hz |
| Product Weight | 1.9 lbs. / 0.9 Kg |
| Shipping Weight | 3.2 lbs. / 1.5 Kg |
| Dimensions | 1.64"H x 8.42"W x 6"D / 4.2cm x 21.45cm x 15.2cm |
| Regulatory Approvals | UL 1950, CAN / CSA-22.2 No. 950, 3 rd Edition CE: EN55022 (1987), EN50081-1 (1991), EN50082-1 (1992 and 1994), EN60950-92 |
| Parts Included | |
| TPR101-1: Twisted Pair Receiver for High-Resolution Video IN9230: IEC Power Cable IN9339: Adjustment Tool with Technician's Blade TPT101 / TPR101 Operation Manual | |

| Required Accessories |
|---|
| CAT5 Link Cable |
| IN9550 - 50' Long IN95100 - 100' Long IN95150 - 150' Long IN95200 - 200' Long IN95250 - 250' Long IN95300 - 300' Long Custom / longer lengths are available via special order. Call INLINE at (800) 882-7117 |
| Input Cables: |
| VGA: IN8000M Series 15-pin HD male to 15-pin HD male, various lengths from 3' to 100' VGA & Stereo Audio: IN8200M Series 15-Pin HD male to male and 3.5mm male to male, various lengths from 3' to 50' For Other Computers: Refer to the table on page 7 |

| Optional Accessories |
|--|
| Audio Input Cables |
| IN9106: 3.5mm stereo mini male to 3.5mm stereo mini male, 6' long IN9107: (1) 3.5mm stereo mini male to (2) RCA male, 6' long |
| Installation Hardware |
| IN9181: 1-Gang Wall-Mounting Bracket for TPT101 IN9080: Rack Shelf - For installing the TPR101 in a standard 19" equipment rack IN9088B: Blank Plate (Black) - Fills the empty space when rack mounting a single TPR101 IN9252: Table Mounting Brackets - For mounting the TPR101 to virtually any flat surface |

Troubleshooting

Problem: The TPT101 / TPR101 is plugged in but the power indicator light / front panel LED is dark.

- **Solution 1:** Make sure that the power adapter is securely plugged into the **TPR101** and the A/C source.
- **Solution 2:** Make sure the A/C source is live.
- **Solution 3:** Make sure the A/C power switch is on.

Problem: LED's on the front panel of the TPR101 are illuminated, but the data display connected to the receiver is dark.

- **Solution 1:** Make sure the data display device is on.
- **Solution 2:** Make sure the power light on the **TPT101** is illuminated.
- **Solution 3:** Make sure that both RJ45 connectors of the CAT5 cable are securely seated in each unit.

Problem: The image on the TPR101 monitor(s) is blurry.

- **Solution 1:** The signal may be overdriven. Adjust the video high frequency control on the **TPR101** so that the signal's intensity matches the length of the CAT5 cable. Gently adjust the regulator until optimum sharpness and picture quality is achieved.
- **Solution 2:** Adjust the monitor's contrast / brightness setting.

Problem: The Power LED on the TPR101 is flashing.

- **Solution 1:** The CAT5 cable may be shorted / defective.
- **Solution 2:** The dipswitches may be set improperly. See the Installation Section on page 4 (step 3) and adjust the dipswitches accordingly.

Problem: The audio signal is picking up interference.

- **Solution:** If video cross talk is too obtrusive in the single CAT5 cable mono audio signal, install a 2nd CAT5 cable and run the signal in the stereo with remote power configuration.

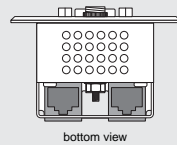
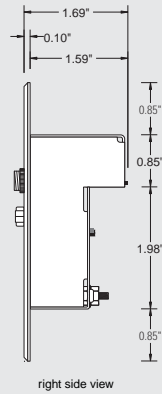
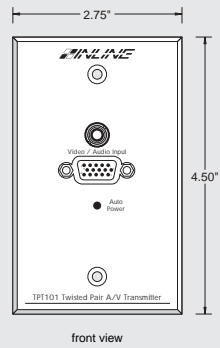
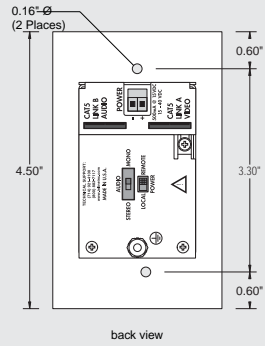
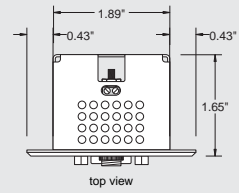
Problem: The operator receives an electrical shock while connecting to the TPT101.

- **Solution:** When dealing with long cable runs, it is possible that you will encounter greatly different grounding potentials in locations throughout the installation facility. Make sure that the Grounding terminal on the back of the **TPT101** is properly grounded to local earth ground to prevent possible electrical shock and / or damage of the system.

If problems persist, call the Extron S³ Sales & Technical Support Hotline at 714.491.1500 for further assistance.

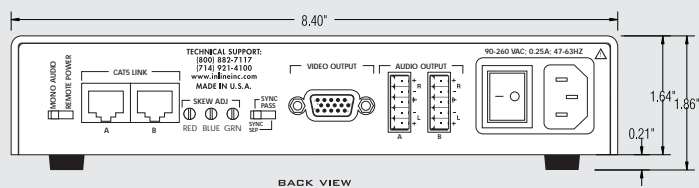
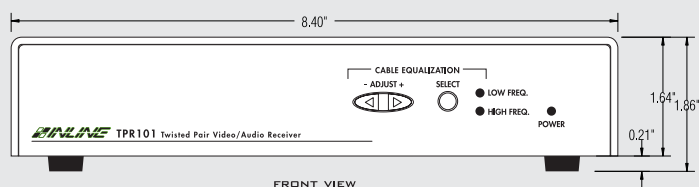
TPT101 TWISTED PAIR TRANSMITTER

PRODUCT DIMENSIONS



TPR101 TWISTED PAIR RECEIVER

DIMENSION DRAWING



Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

**USA, Canada, South America,
and Central America:**

Extron Electronics
1230 South Lewis Street
Anaheim, CA 92805, USA

Asia:

Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363

Europe, Africa, and the Middle East:

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands

Japan:

Extron Electronics, Japan
Daisan DMJ Bldg. 6F,
3-9-1 Kudan Minami
Chiyoda-ku, Tokyo 102-0074
Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.6383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.



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